

## **A Duality between Non-Hermiticity and Curved Spaces**

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Non-Hermitian systems exhibit extraordinary phenomena, ranging from non-orthogonal eigenstates and the non-Hermitian skin effect to the supersensitivity to boundary conditions. This talk will discuss a duality between non-Hermitian models in flat spaces and their counterparts, which could be Hermitian, in curved spaces. For instance, prototypical one-dimensional chains with uniform chiral tunnelings are equivalent to their duals in two-dimensional hyperbolic surfaces, and non-uniform tunnelings could further tailor local curvatures. Such a duality unfolds deep geometric roots of non-Hermitian phenomena, delivers an unprecedented routine connecting Hermitian and non-Hermitian physics, and gives rise to a theoretical perspective reformulating our understandings of curvatures and distance. In practice, it provides experimentalists with a powerful two-fold application, using non-Hermiticity as a new protocol to engineer curvatures or implementing synthetic curved spaces to explore non-Hermitian quantum physics.